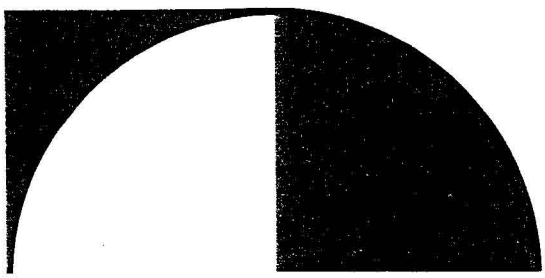

Nakamichi 730

Receiver

Owner's Manual

WARNING

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Please record the Serial Number in the space below to have it as a reference.

Model Number : Nakamichi 730

Serial Number _____

Please read all accompanying Warranty cards and/or notices very carefully.

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Thank you for purchasing the Nakamichi 730 Receiver.

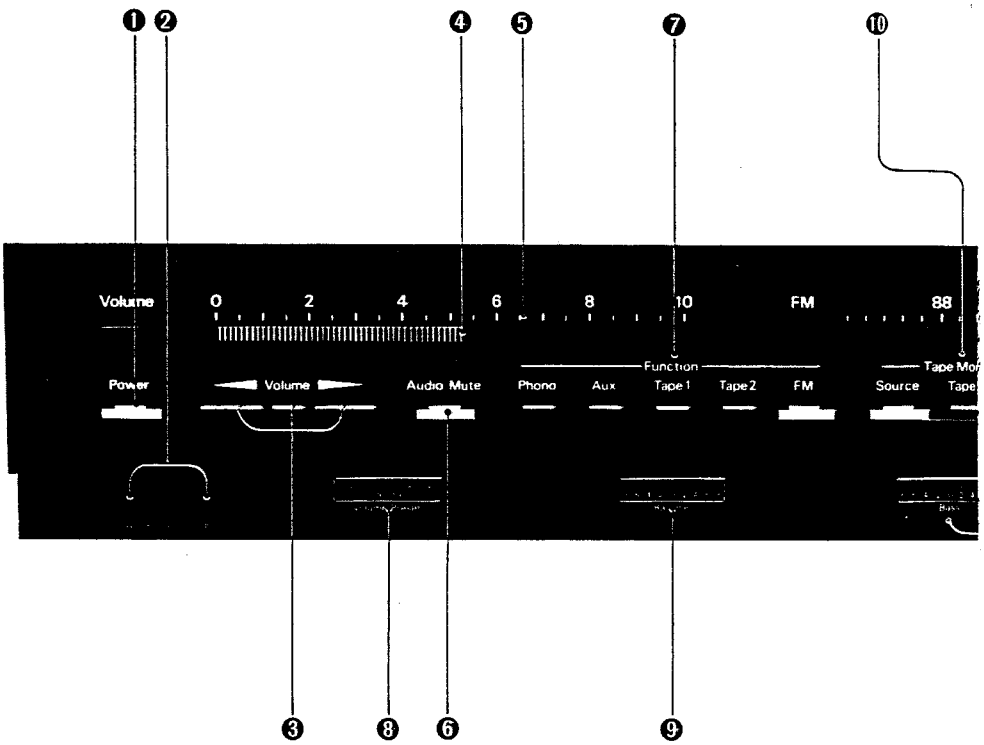
Over the years, Nakamichi Research has been at the cutting edge of electronic and magnetic technology. The Nakamichi 730 is the product of an extensive effort to bring the best in solid state circuitry to the receiver format. But the 730 is more than that. It is a striking essay in human engineering and industrial design.

At the moment, the unique controls and features of the 730 may be unfamiliar to you. This manual has been designed to acquaint you with the 730 in the shortest possible time. The first part of this manual will help you connect the 730. A brief section on operation will review the 730's capabilities. Read the remaining sections at your leisure. They deal with such topics as selecting an FM antenna, checking your speakers for proper phase, and Dolby FM broadcasting.

Nakamichi Corporation

Controls and Features

The 730 Receiver incorporates touch sensors. Most of the functions of the 730 can be controlled by simply touching the appropriate sensor. Lamps immediately under the sensors glow to indicate the control status of the 730. An internal memory retains the control status when the receiver is switched off or disconnected from an AC outlet. Thus, if the receiver is tuned to a specific FM station at a specific volume when you turn it off, it will still be at that station and volume the next time you turn it on. Please note that the touch sensors rely on some residual moisture on the tips of your fingers. If your hands are extremely cold – as they might be during the winter months when you first come in from outdoors–you may need to rub or otherwise moisten your fingertips.



(1) Power Sensor:
Activates the 730 when the master power switch (on the rear panel) is in the "ON" position. When power is on, the orange indicator lamp immediately beneath the sensor will glow. A second touch of the power sensor will turn the 730 off.

(2) Headphone Jacks A and B:
Accept stereo headphones with impedance between 8 and 250 ohms. Inserting a headphone plug into jack A will automatically cut off output to the speakers. You can use headphones and speakers simultaneously by inserting the headphone plug into jack B.

(3) Volume Control Sensors:
The outer two volume sensors raise or lower the volume quickly. Touching either of the outer sensors and the center sensor simultaneously will raise or lower the volume slowly.

(4) Volume Indicator

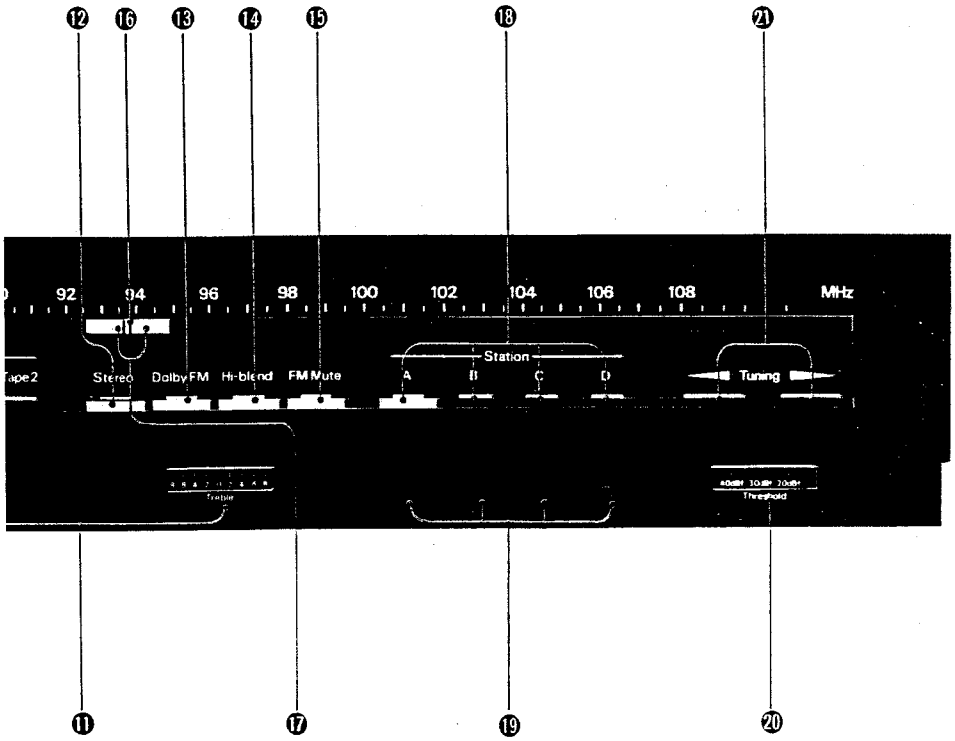
(5) Volume Scale

(6) Audio Mute Sensor:
The audio mute decreases the volume by 14 dB when you touch this sensor. Thus, you can lower the volume temporarily to connect or disconnect headphones, answer a telephone call, or change FM stations. To disengage the audio mute, touch the sensor a second time. The audio mute indicator light will go out and the volume level will return to normal.

(7) Function Sensor Group:
By touching the appropriate sensor, you can select a turntable ("Phono"), either of two tape decks ("Tape 1" and "Tape 2"), FM, or an auxiliary input ("Aux") as the source.

(8) Volume Preset Control:
Sliding the control to the left of its center detented position decreases the volume and applies loudness contour compensation. Sliding the control to the right of the center detent decreases the volume. You can use the volume preset control to supplement the main volume control. By presetting a certain amount of loudness compensation or attenuation, you can establish a comfortable listening level at "10" on the volume scale.

(9) Balance Control:
Sliding the control to the left of its center detented position moves the stereo image toward the left speaker by decreasing the loudness of the right speaker. Sliding the control to the right of the center detent has the opposite effect. You can use the balance control to adjust the stereo image for room conditions and for imbalances in the program material.



(10) Tape Monitor Sensor Group:
When you touch the "Source" sensor, you can listen to the source you've selected on the function sensor group. When you touch either "Tape 1" or "Tape 2," you can listen to the corresponding tape deck, regardless of the source selected on the function sensor group. With a three-head tape deck, the tape monitor feature allows you to audition a tape recording as it is being made.

(11) Tone Controls:
The bass control alters the relative volume of low frequency program material. The treble control does the same for high frequency material. You can use these controls to compensate for room acoustics and deficiencies in the program material, and to adjust the sound quality to your preference.

(12) Stereo Sensor:
Touch this sensor for monophonic sound. The indicator lamp will go out. Touch again for stereo. The indicator lamp will glow. Even with the sensor set for stereo, the indicator lamp will go out when the 730 is receiving a monophonic FM broadcast.

(13) Dolby FM Sensor:
Touch this sensor to properly decode a Dolby FM broadcast when the DB-100 Dolby FM circuit board is installed. The DB-100 is factory-installed in all Nakamichi 730's sold in the United States, and is available as an option in other countries. Selecting Dolby FM when the DB-100 is not installed will interrupt the FM tuner output.

(14) Hi-Blend Sensor:
Selecting Hi-Blend will reduce high-frequency noise during FM stereo reception at some sacrifice of high-frequency stereo separation.

(15) FM Mute Sensor:
The 730 will mute all incoming stations and noise below a fixed level when the FM mute is engaged. Muting will also engage when the tuner is scanning between stations.

(16) Tuning Pointer

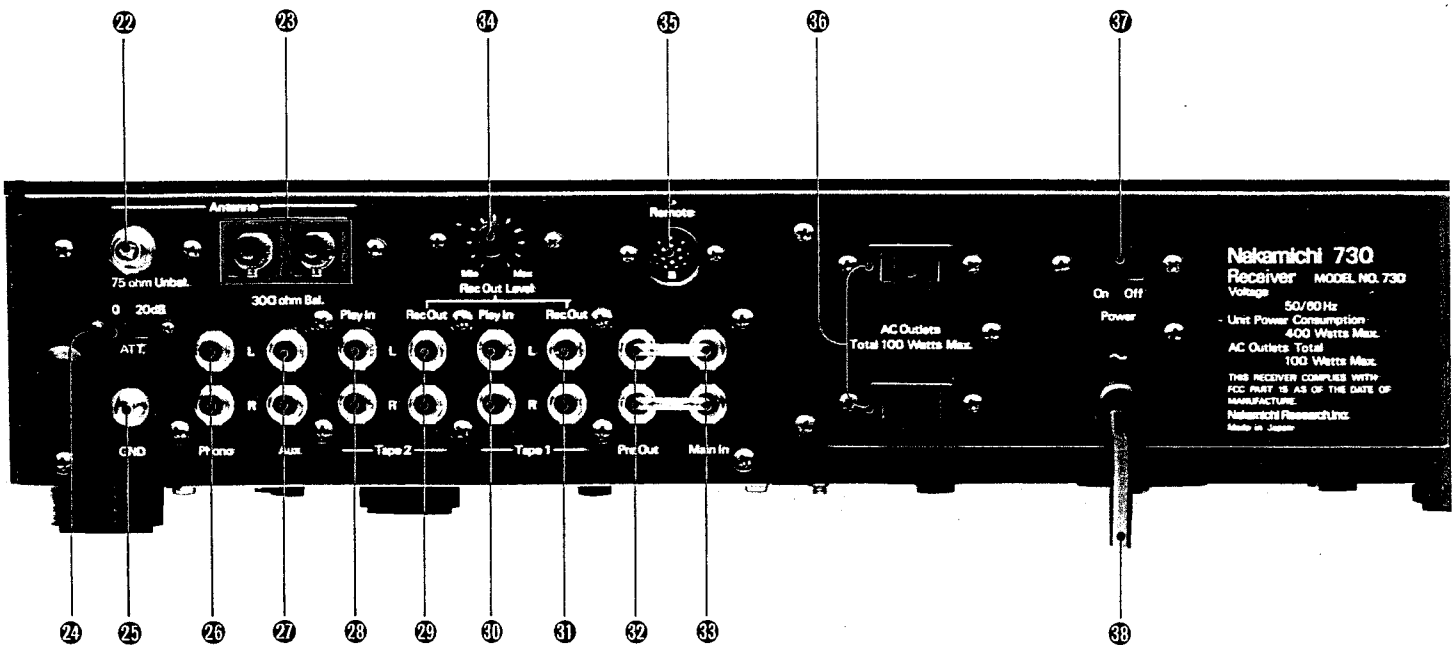
(17) Tuning Lamps:
The two tuning lamps will glow simultaneously to indicate that the tuner is locked onto a station above the threshold level. If the tuner is slightly off-station, one of the two lamps will glow to indicate the direction of the station. If the tuner is receiving a station below the threshold level, neither lamp will glow.

(18) Station Memory Sensors:
Once you have adjusted the station preset controls, touching a station memory sensor will cause the tuner to go directly to an FM station of your choice and lock on to that station. You may preset up to four stations.

(19) Station Preset Controls:
Each station preset control is only active when the corresponding memory sensor has been touched. Use the preset controls to manually tune in up to four selected FM stations. Once preset, each station can be tuned in automatically by touching the appropriate station memory sensor.

(20) Threshold Control:
The threshold control works to reject interstation noise and weak FM stations as the tuner scans for stations. You can use the threshold control to exclude stations below your standards of quiet listening. The higher you set the threshold control (the further to the left), the fewer the stations you will receive from automatic scanning.

(21) Tuning Sensors:
Touch and hold a tuning sensor to have the FM tuner move up or down the FM dial. Touch a tuning sensor and release to have the FM tuner stop at the first FM station above the threshold.



(22) 75-ohm Unbalanced Connector:
Connect any FM antenna using a 75-ohm coaxial cable to this terminal.

(23) 300-ohm Balanced Terminals:
Connect any FM antenna using 300-ohm twin-lead cable—including the supplied dipole antenna—to these terminals.

(24) Attenuator Switch:
In the rare case that the antenna input is too strong for the FM "front end," set this switch to the "–20 dB" position. In all other cases, leave the switch in the "0" position.

(25) Ground Terminal:
Connect the turntable's ground wire to this terminal.

(26) Phono Input Jacks:
Connect the turntable's left channel signal cable to the upper Phono input jack. Connect the right channel cable to the lower jack.

(27) Auxiliary Input Jacks:
Connect the left channel signal cable of an auxiliary source to the upper Aux input jack. Connect the right channel cable to the lower jack.

(28) Tape 2 Playback Input Jacks:
Connect the left channel "Line Output" jack of your second tape deck to the upper Tape 2 Playback Input jack. Connect the right channel to the lower jack.

(29) Tape 2 Recording Output Jacks:
Connect the left channel "Line Input" jack of your second tape deck to the upper Tape 2 Recording Output jacks. Connect the right channel to the lower jack.

(30) Tape 1 Playback Input Jacks:
Connect the left channel "Line Output" jack of your first tape deck to the upper Tape 1 Playback Input jack. Connect the right channel to the lower jack.

(31) Tape 1 Recording Output Jacks:
Connect the left channel "Line Input" jack of your first tape deck to the upper Tape 1 Recording Output jack. Connect the right channel to the lower jack.

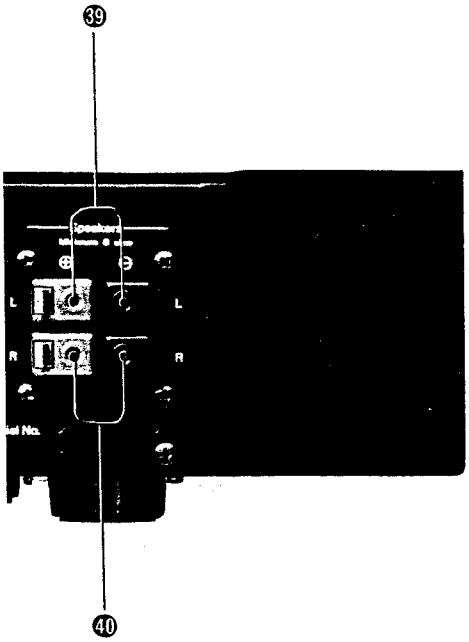
(32) Preamplifier Output Jack:
Normally, you would leave the connectors from the Preamplifier Output jacks to the Main Input Jacks in place. Removing the connectors separates the preamplifier section of the 730 from the power amplifier section for special applications. These include multi-amplification, and the use of filters, signal processors, and speaker equalizers.

(33) Main Amplifier Input Jacks:
The inputs to the power amplifier section of the 730. Normally connected directly to the Preamplifier Output jacks.

(34) Recording Output Level Control:
Varies the "0 dB" recording output level from 100 millivolts to 300 millivolts. Normally you would leave this control in the medium, 12 o'clock position.

(35) Remote Jack:
Provides connection for the Remote Control. The Remote Control duplicates many touch sensor functions of the 730's front panel.

Precautions



(36) AC Outlets:
Supply AC power when the front panel power switch is on. Do not connect equipment with a total maximum power consumption of greater than 100 watts.

(37) Master Power Switch:
You would normally leave this switch in the "ON" position. With the master Power switch set to "OFF," the front panel Power sensor will not activate the 730.

(38) AC Power Cord

(39) Left Channel Speaker Terminals:
Connect the red terminal to the left loudspeaker's positive (+) terminal. Connect the black to negative (—).

(40) Right Channel Speaker Terminals:
Connect the red terminal to the right loudspeaker's positive (+) terminal. Connect the black to negative (—).

(A) Do not install the 730 close to heat sources (such as radiators), or in a place subject to direct sunlight, excessive dust, or moisture.

(B) Leave eight centimeters (three inches) clearance above and to the side of the heat sink fins. This will provide adequate ventilation.

(C) Do not connect equipment with a total maximum power consumption of greater than 100 watts to the AC outlets (36).

(D) Leave the master Power switch (37) off until you have completed all connections.

(E) A muting circuit in the 730 disconnects the output for several seconds after the receiver is switched on to prevent switching transients from reaching your loudspeakers. Leave the volume controls of the 730 at moderate levels until the muting circuit has released. This will prevent a sudden burst of sound when the circuit releases.

(F) Similarly, keep the volume controls of the 730 at moderate levels whenever you connect and disconnect headphones.

(G) Four "AA" size batteries (supplied) maintain the control status "memory" when the 730 is unplugged or when the master power switch (37) is set to "OFF". To install these batteries, place the 730 upside down on a soft surface. Remove the battery cover by unscrewing the two thumb-screws. Install the batteries, taking care to observe the polarity of the battery terminals. Replace the cover. Battery life is about two years. When battery voltage is too low, the orange power indicator lamp on the front panel will flicker.

Connections

Note: Leave the master power switch (37) off until you have completed all connections.

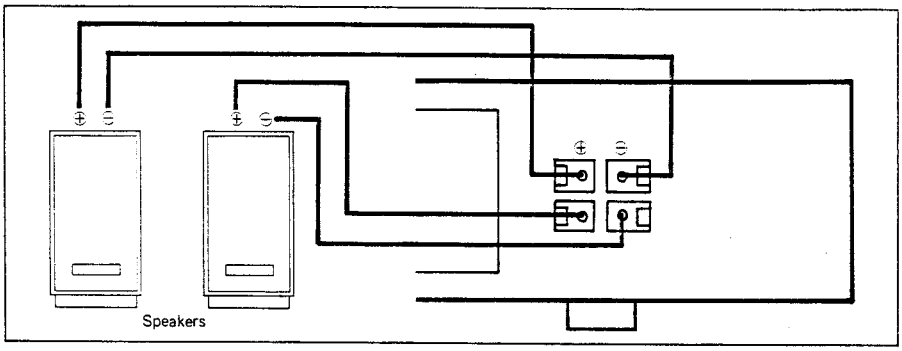
Preparing Speaker Wire

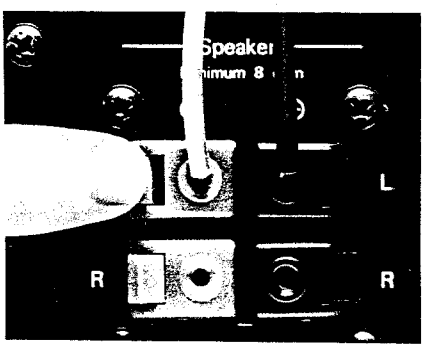
Use stranded, two-conductor wire to connect your loudspeakers to the 730. Sixteen-gauge lamp cord is satisfactory for most applications. For wire runs longer than 8 meters (25 feet), heavier gauge wire (with a lower number) is preferable.

Cut two segments of wire approximately equal in length. Both should be long enough to reach the farther loudspeaker comfortably. Separate the conductors for about 5 centimeters (2 inches) at each free end. Carefully remove about 1 centimeter (one quarter-inch) of insulation from each conductor. Twist the exposed strands of each conductor so that they are smooth and tight. At this point you may wish to "tin" the exposed strands of each conductor with a drop of solder. This will help prevent the strands of one conductor from inadvertently touching the other conductor and "shorting out" the system. For the same reason, do not drive staples or tacks through the center of the speaker wire. A short circuit will reduce the loudness of the system, or eliminate the sound altogether.

Connecting Speakers

Connect the positive (+) right channel speaker terminal (40, red) to the positive (+) terminal of your right loudspeaker. (Loudspeakers are generally marked "+" and "—", although some speakers use other labelling systems, such as "1" and "0", "hot" and "ground", etc.). Hold the button on the side of the 730's terminal down as you insert the conductor into the hole. Release the button. The conductor should now be locked firmly into place. In the same manner, connect the negative (—) right channel speaker terminal (40, black) to the negative (—) terminal of your right loudspeaker. Repeat the procedure for the left channel terminals (39) and your left loudspeaker. Take care to observe the polarity of the terminals as you did with the right channel.

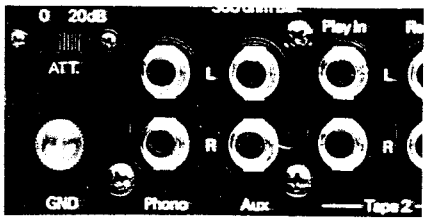




Lamp cord usually provides a code which differentiates the two conductors. This code enables you to connect the proper amplifier terminals to the proper speaker terminals without tracing down the length of each conductor. The code may consist of a rib, sharp corner, or indentations molded along the length of the insulation of one conductor. In some cases, a thin colored thread is molded inside the insulation, along with one conductor. In the most frequent case, each conductor (or the insulation of each conductor) is a different color. The section of this manual titled "About Speaker Phasing" describes the purpose behind differentiating the conductors and terminals.

Turntable Connections

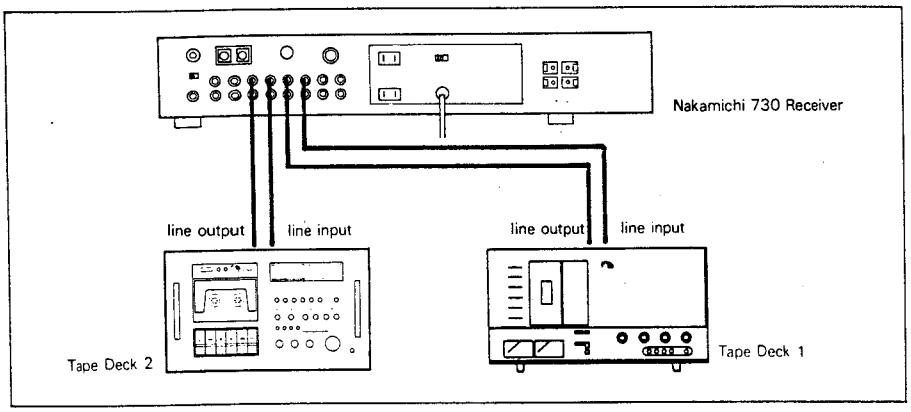
Turntables are usually supplied with color-coded signal cables. Consult the turntable owner's manual to determine which is the left channel signal cable and insert its plug into the upper phono input jack (26). Connect the right channel cable to the lower jack. If the turntable is supplied with a separate ground wire, connect it to the ground terminal (25).



Tape Recording and Playback Jacks

The tape recording output (29, 31) and playback input (28, 30) jacks are usually used to connect tape decks to the 730. They can also be used to connect external dynamic processors, noise reduction systems, graphic and parametric equalizers, etc. Consult the signal-processor owner's manual on the best method of interconnection.

To connect tape decks, start by connecting the line outputs of your first tape deck to the tape 1 playback input jacks (30). Connect the left channel to the upper jack and the right to the lower jack. Connect the line inputs of your first tape deck to the tape 1 recording output



jacks (31). Connect the left channel to the upper jack and the right to the lower jack.

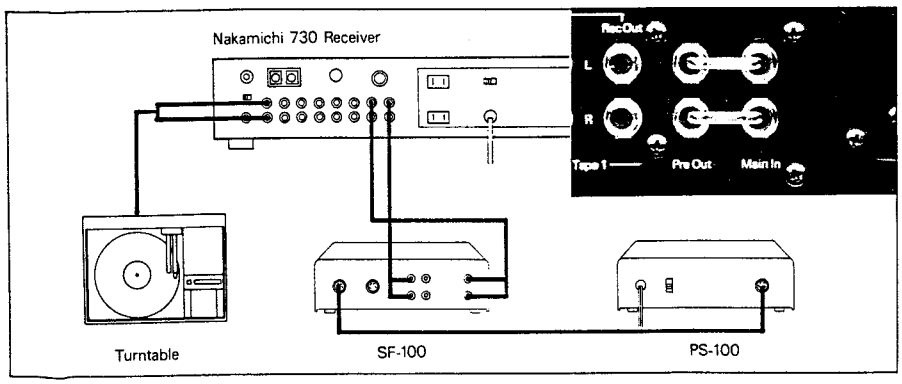
For a second tape deck, repeat the procedure using the tape 2 playback input (28) and recording output (29) jacks.

Auxiliary Sources

The auxiliary input jacks (27) allow the connection of any "line level" source. Such sources include the output of a third tape deck; an AM, long-wave, marine, aircraft, or citizen's band tuner; and the audio output of a television set. Consult your dealer if you have questions regarding the compatibility of an auxiliary source.

Preamplifier Output/Main Amplifier Input Jacks

Normally, you would leave the connectors from the preamplifier output jacks (32) to the main amplifier input jacks (33) in place. Removing the connectors separates the preamplifier section of the 730 from the power amplifier section for special applications. These include four-channel sound with a quadraphonic adaptor, multi-amplification with an electronic crossover, loudspeaker equalization for speakers which require special equalizers, signal processing, and filtering. The jacks also allow you to use the preamplifier section of the 730 with another power amplifier, or the power amplifier section with another preamplifier. The diagram illustrates how you would connect the Nakamichi SF-100 Subsonic Filter to the preamplifier output and main amplifier input jacks.



Remote Control

The remote jack (35) provides connection for the Remote Control. The Remote Control duplicates many touch sensor functions of the 730's front panel.

FM Antenna Connections

The T-shaped dipole antenna supplied with the 730 may be sufficient for your reception conditions. The dipole is a balanced system and should be connected to the 300-ohms balanced terminals (23). If you are using a more sophisticated system, determine whether the cable is 300-ohm twin-lead (usually flat) or 75-ohm coaxial (usually round). Connect 300-ohm twin-lead cable to the 300-ohms balanced terminals. Connect 75-ohm coaxial cable to the 75-ohms unbalanced connector (22). If the coaxial cable does not have its own F-type connector, follow the instructions on fitting the supplied connector in the section entitled "About FM Antennas". The section also gives general advice about using and connecting various types of antenna systems.

Power Connections

The AC outlets (36) supply power when the front panel power switch is on. You can connect the AC power cords of two pieces of associated equipment (for example, a turntable and a cassette deck) to these outlets. Do not connect equipment with a total maximum power consumption of greater than 100 watts.

After all connections have been made, make sure that the master power switch (37) is set to off. Then connect the AC power cord (38) of the 730 Receiver to a wall outlet.

Operation

Note: The touch sensors of the 730 rely on some residual moisture on the tips of your fingers. If your hands are extremely cold—as they might be during the winter months when you first come in from outdoors—you may need to rub or otherwise moisten your finger-tips.

Power

Set the master power switch (37) on. Normally, you will be leaving this switch on. Touch the front panel power sensor (1). The orange power indicator will illuminate, as will the tuning pointer (16). The appropriate lamps of the function sensor group (10) will glow to show the input status of the 730. If a pre-set FM station has been tuned, one of the station memory sensor (18) lamps will glow. Similarly, the audio mute (6), stereo (12), Dolby FM (13), hi-blend (14), and FM mute (15) lamps will be on or off to indicate the status of the respective circuits. Finally, the volume indicator (4) will show the relative position of the volume control.

Each time you turn the receiver on, it assumes the same control status as when you last switched it off.

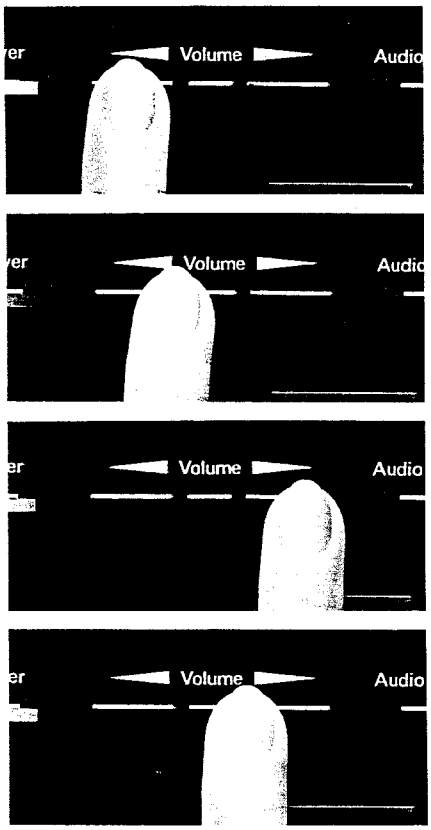
To turn off the 730, simply touch the power sensor (1) a second time.

Selecting a Source

If the lamp of the "Source" sensor in the tape monitor sensor group (10) is not glowing, touch the "Source" sensor. Select the desired source by simply touching the appropriate sensor in the function sensor group (7).

Using the Volume and Tone Controls

We suggest that you play a tape or a disc first, and acquaint yourself with the volume and tone controls. There are three volume control sensors (3). The outer two sensors raise or lower the volume



quickly. Touching either of the outer sensors and the center sensor using one finger will raise or lower the volume slowly. You can note the effect of touching these sensors by watching the movement of the volume indicator (4).

The audio mute decreases the volume by 14 dB when engaged. Thus, you can lower the volume temporarily to answer a telephone call, disconnect headphones, etc. To engage the audio mute, touch the audio mute sensor (6). The indicator lamp will glow. To disengage the audio mute, touch the sensor a second time. The indicator lamp will go out and the sound level will return to normal.
The indicator lamp will go out and the sound level will return to normal.

The 730 is capable of great power output. In most listening rooms and with most loudspeakers, sustained full output will be intolerably loud. Without the volume preset control (8), most people would never use the 730 with the volume indicator (4) any higher than "3" or "4" on the volume scale (5). The volume preset control allows you to establish a comfortable listening level at "10" on the volume scale. Sliding the control to the right of its center detent decreases the volume. Sliding the control to the left of its center detent applies loudness compensation along with decreasing volume.

Loudness compensation boosts the very high and very low frequency content of the program material. This action compensates for the ear's relative insensitivity to extreme frequencies at low volume levels. Sliding the volume preset control further to the left of the center detent will lower the overall volume while adding stronger loudness compensation boost at the extreme frequencies.

The tone controls (11) alter the relative volume of high and low frequency program material. You can use these controls to compensate for room acoustics and deficiencies in the program material, and to adjust the sound quality to your preference. Sliding the bass control to the right of its center detent boosts the bass. Sliding the control to the left cuts the bass. Similarly, sliding the treble control to the right increases the treble. Sliding the control to the left decreases the treble.

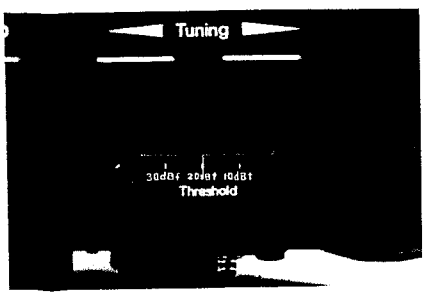
The balance control (9) can be used to adjust the stereo image for room conditions and for imbalance in the program material. Moving the control to the left moves the stereo image towards the left speaker. Moving the control to the right moves the image toward the right.

FM Tuning

Make sure that the "Source" lamp in the tape monitor sensor group (10) is glowing. If it is not, touch the "Source" sensor. Touch the "FM" sensor of the function sensor group (7). For the moment, put the threshold control (20) to the extreme right-hand side of its travel. Now you can use the tuning sensors (21) to tune in a station.

Touch and hold a tuning sensor to have the FM tuner move up or down the FM dial. Touch a tuning sensor and release to have the FM tuner stop at the first FM station. You will notice that the tuner will automatically reverse direction if you allow it to run to the end of the dial. The tuner finds FM stations and locks onto them automatically. When the tuner is locked onto a station, the tuning lamps (17) on both sides of the pointer will glow. If you observe the tuning pointer (16) motion carefully, you will see that the tuner does not simply go to a station and stop. Rather, it actually "seeks" the center of the station's broadcast channel and comes to rest only after a brief period of fine-tuning.

As you use the tuning sensors (21), you will notice that the noise between stations is automatically muted. This is true regardless of the FM Mute sensor (15) setting. The threshold control (20) enables you to reject weak FM stations below you standards of quiet listening.



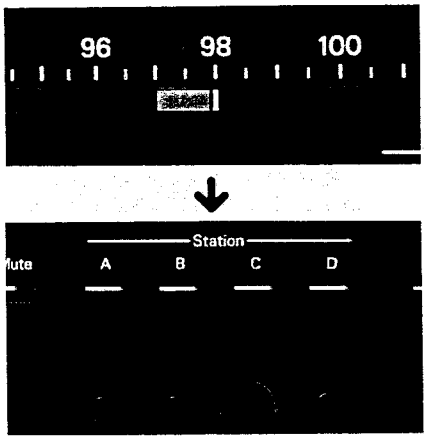
The higher you set the threshold control (the further to the left), the stronger the stations you receive will be. At the highest setting, you will receive only the strongest stations in your area.

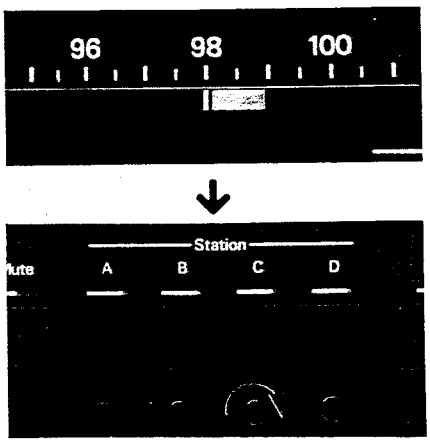
To properly decode a Dolby FM broadcast, touch the Dolby FM sensor (13). This will engage the DB-100 Dolby FM circuit board, if installed. The DB-100 is factory installed in all Nakamichi 730's sold in the United States, and is available as an option in other countries. Selecting Dolby FM when the DB-100 is not installed will interrupt the FM tuner output. For proper sound, use the Dolby circuit for Dolby FM broadcasts only.

Pre-Setting FM Stations

You can use the station preset controls (19) to manually tune in up to four selected FM stations. Once preset, each station can be tuned in automatically by touching the corresponding station memory sensor (18). The preset controls are only active when the corresponding memory sensor has been touched and the sensor lamp is glowing.

To pre-set a station, touch the desired station memory sensor. Turn the corresponding preset control to tune in the station as you would on a conventional tuner. Turn clockwise to move the tuning pointer to the right. Turn counterclockwise to turn the pointer to the left. As





you approach the station, one of the tuning lamps (17) will glow to indicate the direction of the station. Keep turning the preset control until both tuning lamps are lit. The tuner will be locked onto the station. As long as you leave the preset control there, the tuner will automatically go to your selected station when the corresponding station memory sensor is touched.

If you are trying to pre-set a particularly weak or distant FM station, you may need to turn off the muting. If the FM muting is on, the FM mute sensor (15) lamp will be glowing. To disengage the muting, touch the sensor (15). In this case, the station will not be strong enough to cause the tuning indicators to glow. Tune in the station by actually listening to the program and adjusting for optimum sound.

Receiving Weak FM Stations

Set the threshold control (20) to the extreme right-hand side of its travel when you want to search for weak and distant FM stations ("DX"). When you receive an FM stereo broadcast the lamp of the stereo sensor (12) will glow. If it is a particularly weak broadcast, you can reduce the noise by engaging the hi-blend. The hi-blend sacrifices high frequency separation for low-noise reception. To engage it, touch the hi-blend sensor (12). The sensor's lamp will glow. To disengage the hi-blend, touch the sensor again. The lamp will go out. If the noise is still obtrusive, you can get quieter reception in the monophonic mode. Touch the stereo sensor (12). The stereo lamp will go out and the 730 will receive all broadcasts in "mono". For special applications, you can also have monophonic playback of records and tapes. Be sure to return the sensor to the stereo mode when you have finished.

Tape Playback

To play back a tape, make sure that the tape monitor sensor group (10) is set for "Source". Set the function sensor group (7) to the desired tape deck. Use the volume and tone controls as you would for a record or FM broadcast.

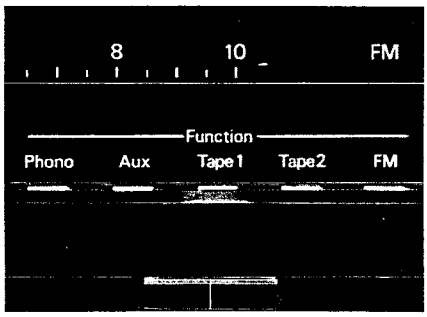
Tape Recording

Make sure that the tape monitor sensor group (10) is set for "Source". Select the desired input source on the function sensor group (7). Set the tape deck in the record mode and start the tape. The signal at the tape recording output jacks (29, 31) is not affected by the volume sensors (3), the audio mute (6), the level preset control (8), the balance control (9), or the tone controls (11). You can use these controls as you record without inadvertently altering the tape recording.

If you find that you are not getting sufficient output from the 730 to drive the meters of your tape deck to 0 db (0 VU), advance the recording output control (34) by turning it clockwise as seen from the rear of the 730. The tape recording outputs provide a maximum standard output level of 300 millivolts.

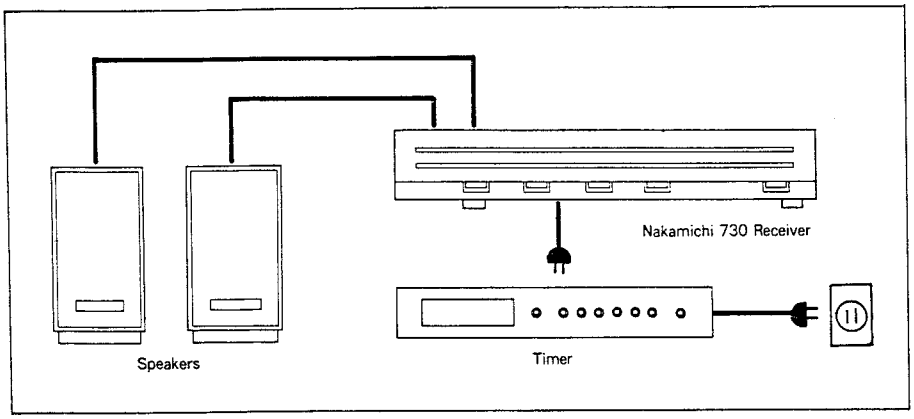
If you have a three-head tape deck, you can monitor the recording as it is being made by selecting the appropriate sensor in the tape monitor sensor group (10). This allows you to check the tape for recording quality.

You can record from one tape deck to another. Select your source (or "master") tape on the function sensor group (7) as you would any other source. If your recording (or "slave") deck is a three-head machine, you can monitor the recording as it is being made my selecting the appropriate sensor in the tape monitor sensor group (10).



Note: If you select either the "Tape 1" or the "Tape 2" sensors in the tape monitor sensor group (10) when a tape deck is not connected and playing back, no sound will be heard, regardless of the status of the function sensor group (7). For this reason, always return the tape monitor sensor group (10) to "Source" when you have completed monitoring a tape. This will allow you to hear whatever source is selected on the function sensor group (7).

Note: When recording a Dolby FM broadcast, use both the receiver's DB-100 (if installed) and the tape deck's noise reduction system (if any) for best results.



Headphones

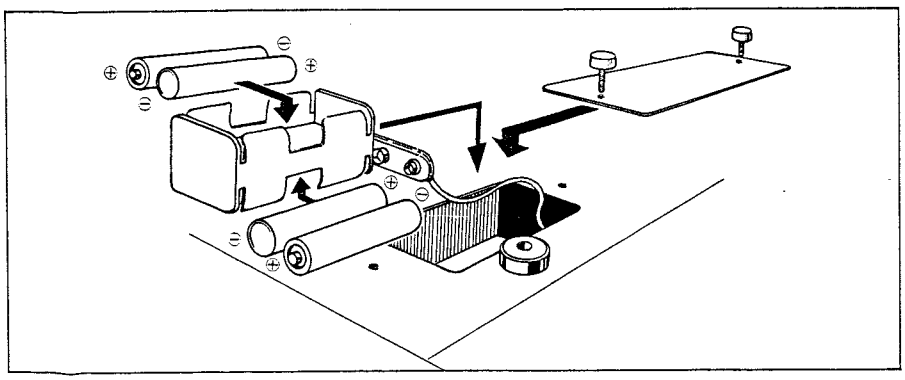
The front panel headphone jacks A and B (3) accept stereo headphones with impedance between 8 and 250 ohms. Inserting a headphone plug into jack A will automatically cut off output to the speakers. You can use headphones and speakers simultaneously by inserting the headphone plug into jack B. To avoid a sudden burst of sound when you connect or disconnect headphones, be sure to keep the volume control low, or engage the audio mute (6). After the connection or disconnection has been made, slowly bring up the volume or release the audio mute.

Timer Operation

Because the 730 is equipped with a battery-powered memory system, the receiver "remembers" its control status even when unplugged. This allows for automatic operation with an external timer. First select the source and volume levels as you would normally. Leave the power on. Disconnect the AC power cord (36) from the wall outlet and connect it to the timer. Set the timer to the desired starting time. The 730 will commence playing at the desired time.

Memory Batteries

Four "AA" size batteries maintain the control status "memory" when the 730 is unplugged or when the master power switch (37) is set to "off". Battery life is about two years. When battery voltage is too low, the orange power indicator lamp on the front panel will flicker. To replace the batteries, place the 730 upside down on a soft surface. Remove the battery cover by unscrewing the two thumbscrews and replace with four fresh "AA" batteries.



About Speaker Phasing
About Dolby FM

ABOUT SPEAKER PHASING

Speaker phasing refers to the connecting of two stereo speakers to the receiver in the same way. That is, the red terminal on the 730 should be connected to the positive speaker terminal in each case, and the black to the negative. If you have followed the suggestions on speaker wire coding and connection, your speakers should now be in phase.

The diaphragms of speakers that are in phase with each other move simultaneously in the same direction in response to the same signal from the 730. The aural result is firm, solid bass and precise stereo imaging. Speakers that are out of phase produce weaker bass and less coherent, less precise location of the sound.

To check for proper phasing by ear, play a source with a single speaking or singing voice, or a solo instrument. Touch the stereo sensor (12) so that the indicator light goes out and the 730's output is monophonic. In this way, both loudspeakers will be receiving the same signal. Stand in a position equidistant between the two speakers. If the voice or instrument appears to be coming from an area directly between the two speakers, they have been connected correctly and are in phase. If the sound appears to be coming from two individual speakers, they have been connected incorrectly and are out of phase.

To correct phasing, reverse the positive and negative connections at the terminals of one speaker. The speakers will now be in phase.

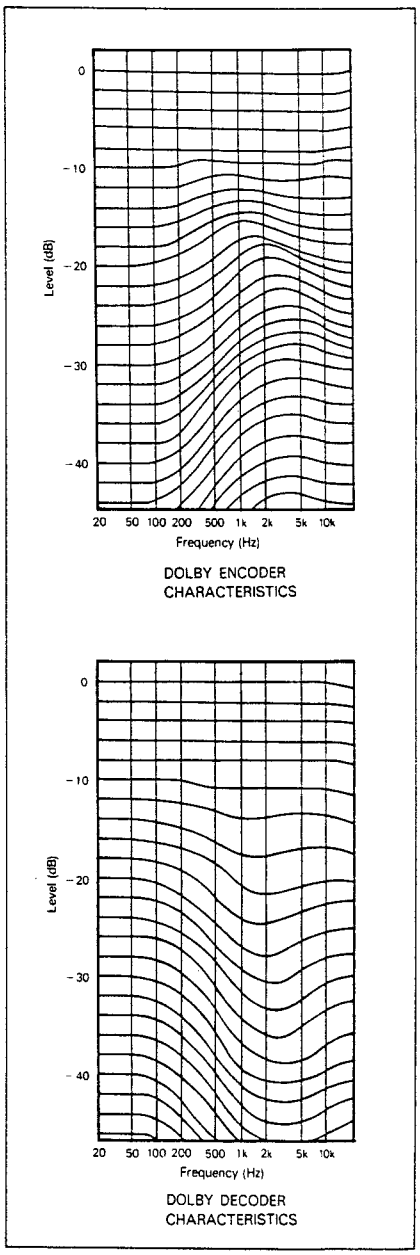
ABOUT DOLBY FM

FM broadcasting has always been accompanied by high-frequency noise. Combatting the noise has required strong boosting of the high frequencies at the transmitter (pre-emphasis) and complementary reduction of the highs at the tuner (deemphasis). As the high frequency signal is reduced by the tuner, so is the high frequency noise.

Pre-emphasis has been effective, but it faces an inherent limitation. By law, a station may not exceed a certain modulation level. The restriction is not arbitrary. It leaves space between stations on the band and allows tuners to select out one station at a time. But to stay within the modulation limit, broadcasters using conventional pre-emphasis must make a difficult choice: either modulate at an overall lower level or artificially "limit" the loudest high-frequency material. The first alternative results in precisely what pre-emphasis was supposed to counter in the first place: noise. The second alternative reduces the difference between the loud and soft passages. The overwhelming majority of FM broadcasters have resorted to high-frequency limiting to avoid overmodulation. For this reason, even the best FM broadcasts have lacked the dynamic range of today's high-quality discs.

Dolby FM improves reception in two important ways: lower noise and greater high-frequency dynamic range.

Low noise is the result of the well-known Dolby B-type Noise Reduction system, the same as found on many tape decks. Like pre-emphasis, Dolby encoding at the transmitter boosts the high frequencies. Unlike pre-emphasis, the Dolby encoder's boost varies according to level. The encoder only boosts low-level high-frequency material. Dolby decoding at the tuner gives high frequencies an equal and opposite reduction. In so doing, Dolby decoding reduces high-frequency noise.



The increase in high-frequency dynamic range is largely due to the new Dolby FM standards for pre-emphasis and de-em-

About FM Antennas

phasis. In the United States the 75 microsecond time constant defines the conventional FM de-emphasis curve. 50 microseconds is the standard in most European countries. Dolby FM uses a new 25 microsecond standard. Because Dolby FM uses less pre-emphasis/de-emphasis and because Dolby encoding only boosts low-level high frequency signals, Dolby FM eliminates the danger of high-frequency overmodulation. Stations no longer need resort to drastic limiting. Listeners receive full, unconstricted dynamic range.

The 25 microsecond standard has a subsidiary benefit. Dolby encoding makes music sound unnaturally "bright" when heard without the proper Dolby decoding. The new pre-emphasis makes music sound unnaturally "dull" when received with the old de-emphasis. The two effects tend to counteract each other, producing a close approximation of flat frequency response. Thus, the Dolby FM broadcasts produce acceptable sound with conventional tuners. However, if there are high-quality Dolby FM broadcasts in your area, you will notice a new clarity in the sound when you switch to Dolby FM.

The DB-100 Dolby FM circuit board is factory-installed in all Nakamichi 730's sold in the United States, and is available as an option in the other countries. With the DB-100 installed, touching the Dolby FM sensor (13) will select both Dolby decoding and 25 microsecond de-emphasis. Selecting Dolby FM when the DB-100 is not installed will interrupt the FM tuner output. For proper sound, use the Dolby circuit for Dolby encoded broadcasts only.

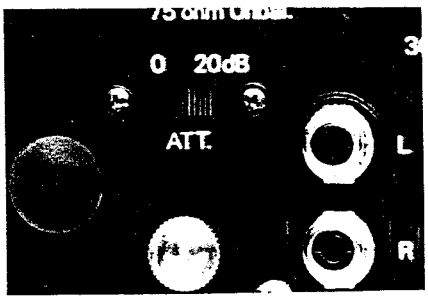
When recording a Dolby FM broadcast, use both the receiver's decoder and the noise reduction system of the tape deck (if any) for best results.

ABOUT FM ANTENNAS

The FM section of the 730 offers an excellent balance of performance in the areas of sensitivity, selectivity, stereo separation, low noise, and low distortion. Yet the quality of FM reception you experience will only be as good as the signal entering the 730's antenna terminals. You can ensure that the 730's tuner is performing at its best by selecting the proper FM antenna and installing it correctly. The T-shaped dipole antenna supplied with the 730 may be sufficient for your reception conditions. If it is not, a variety of more sophisticated alternatives are available. The following discussion is intended as a general guide. Your Nakamichi dealer can help you select an antenna system to fit your specific reception conditions.

There are three basic obstacles to good FM reception. By far the most common is weak or insufficient signal. This is a familiar problem in rural and fringe reception areas. If signals are weak, you will receive few stations. Those stations you do receive may be noisy and distorted. The solution here is a high-gain FM antenna.

The second problem, multipath distortion, usually occurs in cities and mountainous areas. Like light, FM signals travel through the air in a straight line. Like light, FM signals may reflect from surfaces. When signals reflect from mountains or tall structures near the antenna, the reflected signals arrive at the antenna after the direct broadcast signal. This causes multipath distortion. In television, multipath causes "ghosting" and color aberration. In FM, it is primarily heard as buzzing or sibilant "S's" during announcements. The solution to multipath is a carefully-aimed, directional FM antenna.



The third problem is the least common. High-gain antennas, and antennas situated very close to FM transmitters may actually present too strong a signal to the antenna terminals of the 730. When this happens, the "front end" of the FM section will saturate. This saturation will introduce distortion which subsequent stages of the 730 cannot remove. Fortunately, this problem is easily solved. The 730 features an antenna input attenuator switch (24) on the back panel. Moving the switch to "–20dB" will reduce the amount of signal going into the FM front end. Normally, you would keep this switch in the "0" position.

Indoor Antennas

In some cases, "rabbit ears" or other indoor FM/television antennas will provide better reception than the dipole. Some indoor configurations are much more directional than the dipole. As such, they afford a reduction in multipath distortion. But if you are in a weak signal area, the improvement with indoor antennas will be marginal.

Outdoor TV Antennas and Cable Systems

In the United States, the FM band lies between television channels 6 and 7. Some television systems can be used for FM reception. However, other television systems deliberately filter out the FM band, and will not offer superior FM reception. If you want to use your outdoor TV antenna, check the antenna owner's manual for information on FM

compatibility. If you live in an apartment with a master TV antenna system, ask your building superintendent about the suitability of the system. If you receive cable TV service, ask your cable supplier. If the TV system is suitable, you may need a "splitter" to provide service for both your television set and the 730 Receiver.

Selecting an Outdoor FM Antenna

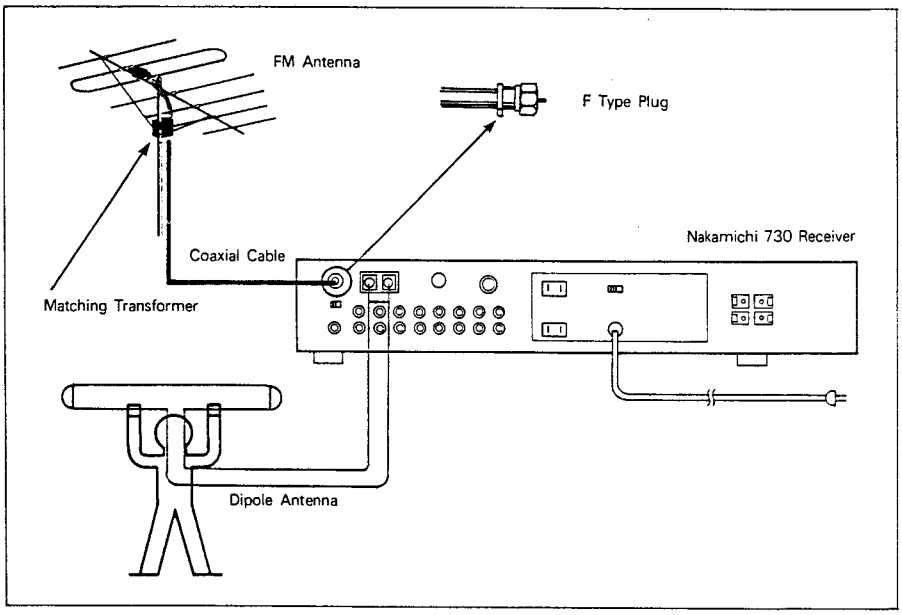
Outdoor FM antennas vary in gain and directionality. Generally, antennas with more elements have higher gain. Choose an antenna with three to eight elements, depending on your distance from the transmitters and other conditions. To avoid noise, be sure to place the antenna as far from highways as possible. For safety as well as low noise, place the antenna as far from power lines as possible.

If you have a highly directional antenna, it must be aimed towards the transmitters. If there are transmitters in several different directions from your antenna, you may require a remote-controlled rotor system to turn the antenna.

Transmission Line

Most outdoor FM antennas can be connected directly to 300-ohm twin-lead cable. 300-ohm cable features very low transmission loss (about 0.04 dB per meter). Although the transmission loss of most 300-ohm cables worsens during wet weather, you can buy waterproof versions. Unfortunately, 300-ohm twin-lead cable requires special care during installation and is particularly susceptible to noise pick-up. Noise sources include CB radios, automobile ignition, and high-voltage power lines.

Because 75-ohm coaxial cable is shielded, it is virtually immune to noise-pickup. 75-ohm cable usually requires a weatherproof matching transformer at the antenna. And transmission loss with 75-ohm cable is much higher (typically 0.12 dB per meter). If you have both noise pick-up and weak-signal problems, special low-loss coaxial cables are available.

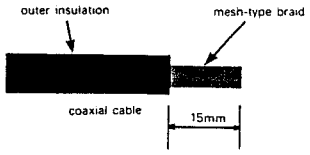


Connections to the 730

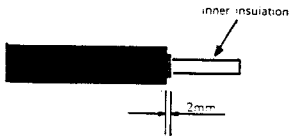
Connect 300-ohm twin-lead cable directly to the 300-ohm balanced terminals (23) of the 730 Receiver. Connect 75-ohm coaxial cable to the 75-ohm unbalanced connector (22). If the coaxial cable is not supplied with an F-connector of its own, you can install the supplied connector with just a knife and pliers.

Installing the F-Connector

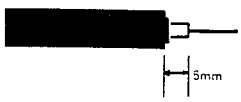
1. Cut and remove about 15 mm of the outer insulation of the 75-ohm coaxial cable.



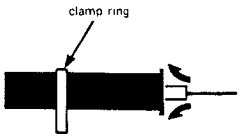
2. Cut and remove most of the shield braid with a knife. Leave about 2 mm at the base, next to the edge of the outer insulation.



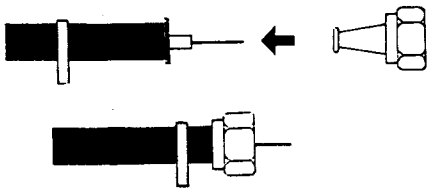
3. Cut and remove the inner insulation, leaving about 5 mm from the edge of the outer insulation.



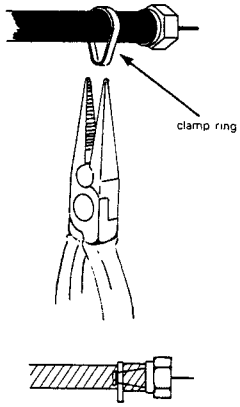
4. Slip the clamp ring onto the cable and pull the shield braid apart and back with your fingers



5. Push the pointed end of the connector into the cable, making sure it is seated between the braid and the inner insulation.

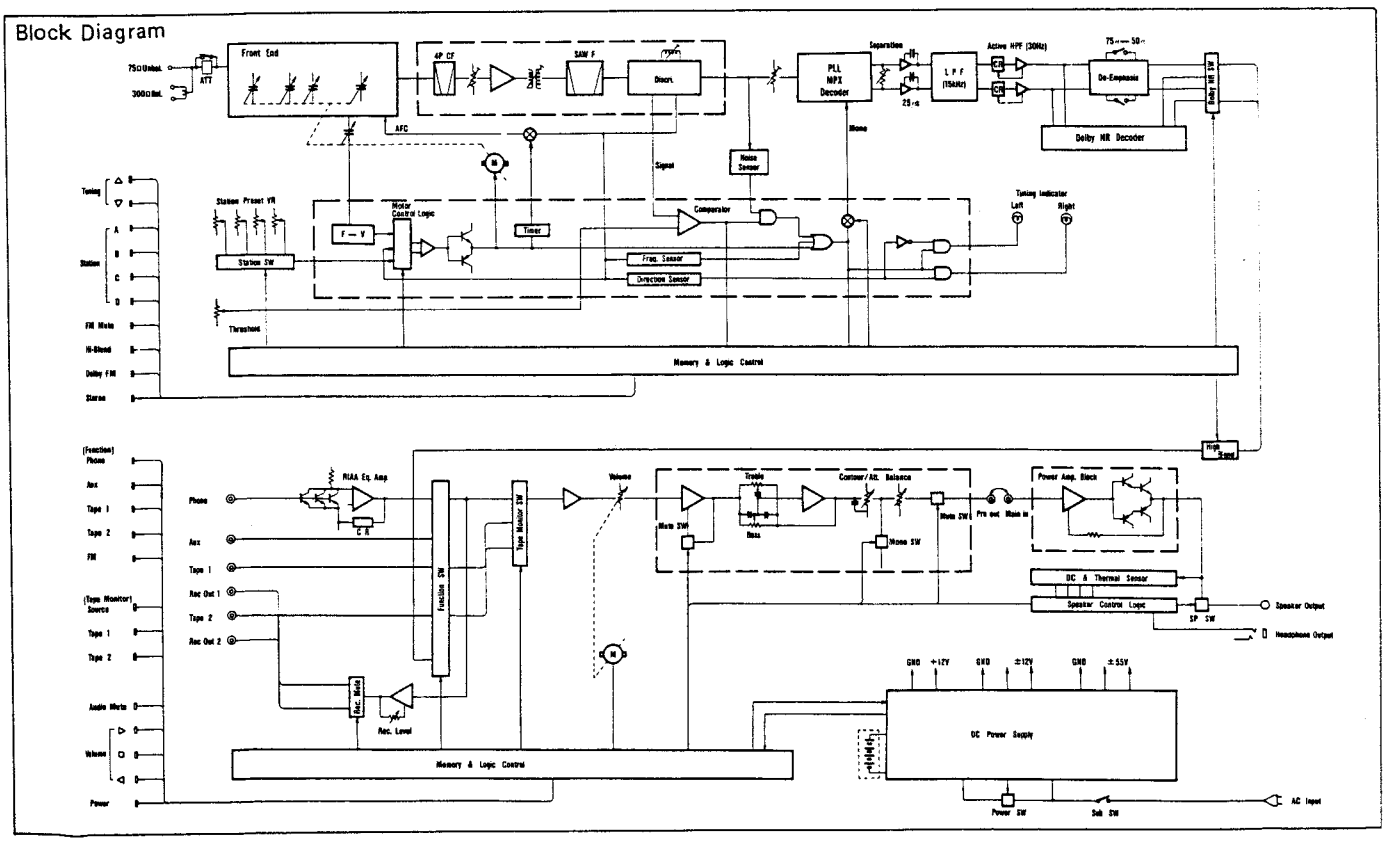


6. Press and crimp the clamp ring with a pair of pliers to secure the connector.



The coaxial cable is now ready to be connected to the 75-ohm unbalanced connector (22) of the 730 Receiver.

Block Diagram



Troubleshooting

As you explore the capabilities of the 730 Receiver, you may inadvertently select a combination of control positions which produces unsatisfactory sound, or no sound at all. The 730 has a great variety of controls – including two power switches (1, 37) and three controls which affect overall volume (3, 6, and 8). The following is a brief guide to the most familiar problems, their probable causes, and their solutions.

Your Nakamichi 730 has been designed for long service life. Should you encounter problems beyond the scope of this torubleshooting guide, please consult your Nakamichi dealer, or the Nakamichi dealer nearest you. As there are no user-serviceable parts inside the unit, please do not attempt your own repairs.

No Power

First check to make sure that the AC power cord (38) is firmly seated in the wall outlet. Then check the master power switch (37). Remember that the front panel power sensor (1) will not activate the 730 as long as the master power switch is set to "OFF".

Power, But No Sound or Low Sound

First turn the 730 off and check speaker connections. Make sure that the conductors of the speaker wires touch the metal of the loudspeaker's terminals and the 730's speaker terminals (39, 40). Also check that the positive and negative conductors do not come into direct contact with each other. Such contact causes an electrical short-circuit which could cut out the sound.

If the speaker connections are good, check the preamplifier output jacks (32) and the main amplifier input jacks (33). Make sure that the connectors which are normally inserted into these jacks are, in fact, in place.

If all these connections are good, turn the receiver on and check the control settings. If the tape monitor sensor group (10) is set for "Tape 1" or "Tape 2", you will not hear sound from any other source you might have selected on the function sensor group (7). For this reason, be sure to set the tape monitor sensor group to "Source".

Check the volume indicator (4) for the status of the volume control. Remember that the audio mute sensor (6) and the level preset control (8) also effect the output volume.

If you get insufficient sound from one speaker, be sure to check the position of the balance (9) control.

Phono Hum

The low level connections from the cartridge to the phono input jacks (26) are particularly susceptible to hum pick-up. Even if you have made the connections properly, you can still get hum. First turn off the 730 and check to see that the phonograph cable plugs are firmly seated in the phono input jacks (26). Make sure that a separate ground wire, if supplied, is connected to the ground terminal (25). Make sure that the metal conductor of the ground wire is actually coming into contact with the ground terminal.

If the hum persists, check the connection of the tonearm's signal wires to the cartridge's terminal posts. Make sure all connections are firm.

If the hum still persists, you may find that you get better performance by disconnecting the ground wire from the ground terminal (25). Other possible solutions may include unplugging the power cord of the turntable, the receiver or both and reversing the polarity or the plug; isolating the turntable from transformers, fluorescent lamps and other possible sources of hum; replacing the phono signal cables; and replacing the cartridge.

Low Tape Deck Record Levels

Turn the recording output level control (34) clockwise as seen from the rear.

Noisy Reception

Sometimes the FM antenna and/or transmission line will pick up noise from automobile ignition, citizens' band radio or outdoor power lines. Relocating the antenna and changing to coaxial cable may help.

Noisy stereo reception can be improved by using the hi-blend (14) or in worst cases by setting the stereo sensor (12) for monophonic reception.

If you find that your FM reception is generally weak, make sure that the attenuator switch (24) is in the "0" position. If FM reception is still generally weak and noisy, consult the section entitled "About FM Antennas".

Severely Distorted Reception

In rare cases, the FM tuner of the 730 may be getting too much signal. Consult the section entitled "About FM Antennas" and determine if this is the problem. To correct the problem, set the attenuator switch (24) to "–20 dB"

Sibilant S's During FM Announcements

Typically a sign of multipath distortion, sibilant S's usually indicate a need to re-direct the FM antenna, or to install a more directional FM antenna. Consult the section entitled "About FM Antennas".

No FM Reception

If your 730 is not fitted with the DB-100 Dolby FM circuit board, FM reception will be interrupted whenever Dolby FM is selected. The DB-100 is factory-installed in all Nakamichi 730's sold in the United States, and is available as an option in other countries.

Specifications

Specifications:

Amplifier

Power Output	105 Watts per channel, minimum continuous sine wave at 8 ohms, 5 ~ 20,000 Hz, with less than 0.02% THD			
	150 Watts per channel, minimum continuous sine wave at 4 ohms, 5 ~ 20,000 Hz, with less than 0.1% THD			
IHF Power Bandwidth	10 ~ 20,000 Hz for less than 0.01% THD, both channels driven			
Damping Factor	Greater than 100, 1 kHz, 8 ohms			
Total Harmonic Distortion		<1kHz	<10kHz	<20kHz
	Phono:	0.004%	0.006%	
	Aux, Tape:	0.004%	0.006%	0.04%
	Main Amp:	0.004%	0.008%	0.02%
Intermodulation Distortion	Less than 0.004% at 8 ohms, 105 Watts output (60 Hz: 7 kHz, 4:1)			
Frequency Response				
RIAA Deviation	Within ±0.3 dB			
Aux, Tape in Sp out, 8 ohms	10~30,000 Hz, +0.3, −1 dB			
Main in to Sp out, 8 ohms	10~30,000 Hz, +0, −1 dB			
Input Sensitivity/Impedance				
Phono	2 millivolts/100 kilohms			
Aux, Tape	100 millivolts/10 kilohms			
Main Amp	1 volt/47 kilohms			
Phono Overload	120 millivolts for 0.1% THD at 1 kHz			
Signal-to-Noise Ratio				
Phono	Better than 83 dB, IHF-A, ref. to 2 millivolts (−137 dB equivalent input noise)			
Aux, Tape	Better than 94 dB, IHF-A			
Main Amp.	Better than 115 dB, IHF-A			
Output Level/Impedance				
Rec Out	Variable, 100~300 millivolts/ 3.3 kilohms			
Preamp Out	1 volt /1.2 kilohms			
Residual Noise	Less than 0.3 milivolts, IHF-A, volume control at minimum			
Tone Controls				
Bass	±12 dB at 20 Hz			
Treble	±12 dB at 20 kHz			
Contour Control (maximum)	−12 dB at 20 Hz −23 dB at 3 kHz −14 dB at 20 kHz			
Channel Separation				
Phono in to Sp out	Better than 70 dB with 1 kilohm source impedance, volume control at − 20 dB			
Aux, Tape in to Sp out	Better than 70 dB with 1 kilohm source impedance, volume control at −20 dB			
Headphone Output	60 millwatts into 8 ohms			

Tuner

Usable Sensivitity	2.2 microvolts at 300 ohms (12.0 dBf) for 30 dB quieting
50 dB Quieting Sensitivity	
Mono	4.5 microvolts at 300 ohms (18.3 dBf)
Stereo	45 microvolts at 300 ohms (38.3 dBf)
Signal-to-Noise Ratio	
Mono	Better than 75 dB at 65 dBf
Stereo	Better than 68 dB at 65 dBf
Muting Threshold	5.4 microvolts at 300 ohms (20 dBf)
Frequency Response	30~15,000 Hz +0.5, −1.5 dB
Distortion	
Mono	Less than 0.1% at 1 kHz, 100% modulation, 65 dBf
Stereo	Less than 0.15% at 1 kHz, 100% modulation, 65 dBf
Capture Ratio	1.5 dB
Channel Selectivity	Better than 70 dB
Stereo Separation	Better than 45 dB at 1 kHz Better than 30 dB at 10 kHz
Spurious Response Rejection	Better than 90 dB at 98 MHz
Image Rejection	Better than 85 dB at 98 MHz
IF Rejection	Better than 85 dB at 98 MHz
AM Suppression	Better than 55 dB
SCA Rejection	Better than 70 dB
Frequency Drift	Less than ±50 kHz, -5° to +55°C, 1 kHz
MPX Filter	-70 dB at 19 kHz
Antenna Input	300 ohms balanced or 75 ohms unbalanced
Frequency Band	88 MHz ~ 108 MHz

General

Power Requirements	100, 120, 220 or 240 Volts AC, 50/60 Hz
Power Consumption	400 Watts
AC Outlets	2 switched, 100 Watts maximum
Dimensions	500(W) x 90(H) x 370(D) millimeters 19 1/16 x 3 1/2 x 14 1/2 inches
Weight	17.2 kilograms, 38 pounds

- Specifications and appearance design are subject to change for further improvement without notice.
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